Chimney Troubleshooting Guide

This guide is designed to help you understand some of the chimney problems homeowners encounter. The Guide will also answer any questions you may have while completing your **Chimney Problem Questionnaire.**

Each section in the **Troubleshooting Guide** corresponds to a group of questions in the **Chimney Problem Questionnaire.**

Because a variety of factors can affect your chimney's performance, it is important that your Questionnaire is as complete as possible. Your accurate answers will allow ICP's engineering staff to recommend the best solution to your individual chimney problem.

If you look at the homes in your area, you'll notice that most have chimneys. Some are used to vent heating appliances, some to vent open fireplaces. Many homeowners experience performance problems with their chimneys. These problems can be remedied.

Here, at ICP, we have been developing solutions to these problems since 1973. Let's look closely at the factors that affect a chimney's performance.

Types of Heating Appliances

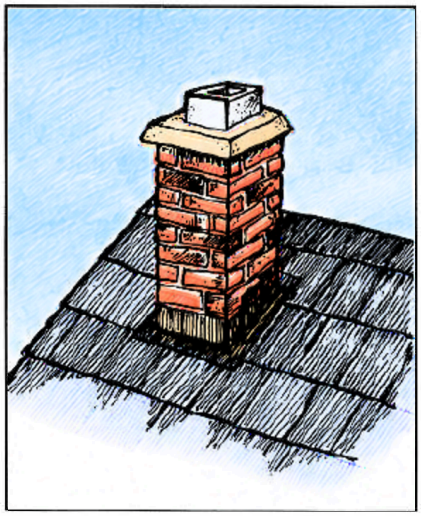
There are four types of heating appliances: stove, furnace, fireplace and fireplace insert. They can be fueled by wood, coal, gas or oil. If more than one heating appliance is vented through the same flue, problems with draft can occur.

Also, differences between the manufacturer's recommended stove pipe size and the actual size of pipe used for a wood or coal burning appliance can affect the stove's performance.

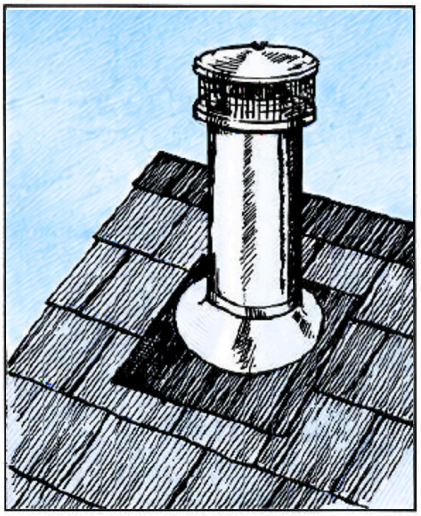
Types of Chimneys

Chimneys may be constructed from either masonry or metal. Both types require a tight seal between the heating appliance and the chimney. It is also important that the chimney is the correct size for the appliance.

Masonry chimneys can be built out of brick, stone or cinderblock. These chimneys may be lined with a clay, firebrick, masonry or metal liner. Chimneys in older homes may not be lined, or the lining may have deteriorated. Leaks along the length of the chimney can affect performance. An open or poorly fitting cleanout door at the base of the chimney can also adversely affect performance.



Masonry Chimney



Metal Chimney

Types of Chimneys (cont.)

Metal chimneys designed for use with heating systems are either Class A with solid insulation or multi-wall air-cooled. Single wall metal pipe chimneys may present a fire hazard. Class A chimneys have insulation between the flue and outer surface. Triple wall chimneys have two air-cooled channels between the flue and the outer wall. Recent innovations in triple wall chimneys feature insulation material in the inner channel and the outer channel is air-cooled.

The shape of the chimney and the effective area of the flue can affect

Sometimes starting a fire or keeping one going is difficult in an airtight house.

performance as does the height of the chimney in relation to the peak of the main roof. Very specific problems are caused by short chimneys with respect to the overall height of the building, such as chimneys constructed on a one story addition to a multi-story building.

How Important is the Connection Between Stove and Chimney?

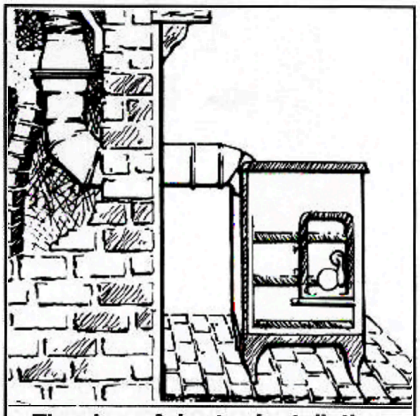
The dimension and the seal of the stove pipe to the chimney also influences performance. Specifically, the pipe size, number of turns and length of the pipe can affect the draft.

Other Factors Affecting Performance

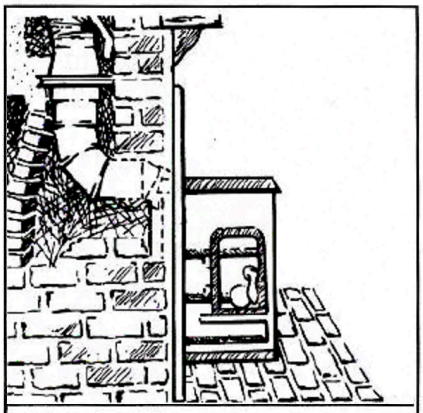
The location of the home with respect to hills, high trees or adjacent buildings can cause problems with downdrafts. Sometimes starting a fire or keeping one going is difficult in an airtight house.

An airtight seal is essential to prevent the formation of creosote which could cause chimney fires.

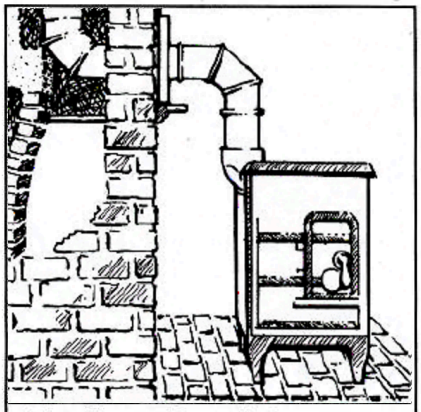
Pictured here are three installations with airtight seals.



Fireplace Adapter Installation



Fireplace Insert



Top-Vented Installation

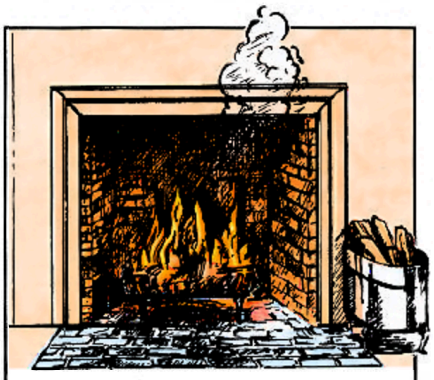
What are Some Common Chimney Problems?

Smoke flowing back into living areas rather than up and out the chimney can occur for a number of reasons. The backpuffing smoke signals that one or more factors may be adversely affecting performance.

Wind induced downdraft is one cause of smoke. Wind induced downdraft is the downward flow of air into a chimney. It can be caused by the deflection of wind by obstacles higher than the chimney, such as neighboring tall trees, hills and buildings.

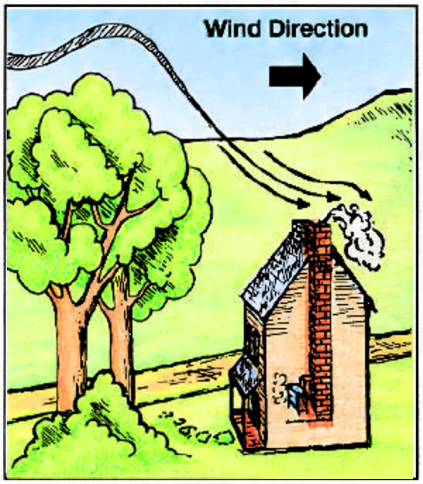
ICP's Vacu-Stack is a proven solution to wind induced downdraft because it prevents wind from blowing into the chimney and allows the smoke to exhaust the chimney without interference.

Dynamic wind loading also can contribute to backpuffing and smoke. Dynamic wind loading may occur in buildings when the wind causes negative inside air pressure.

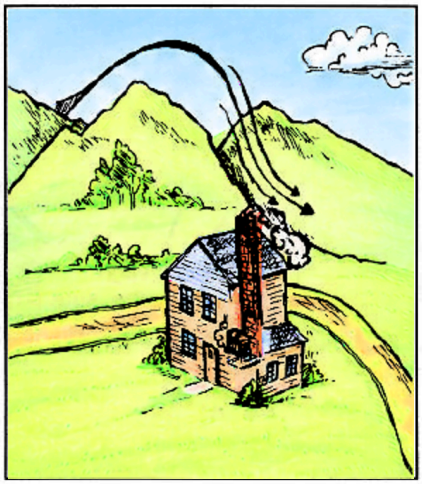


Backpuffing

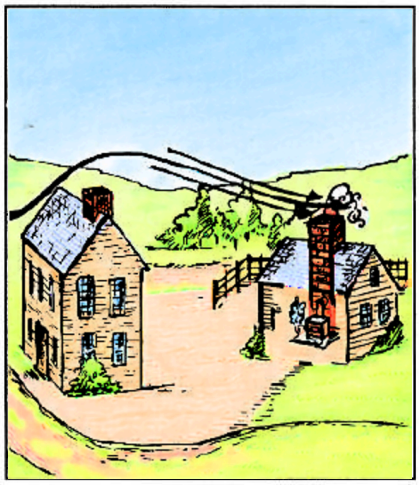
Wind Induced Downdraft



Wind induced downdraft from nearby tall trees



Wind induced downdraft from nearby hills

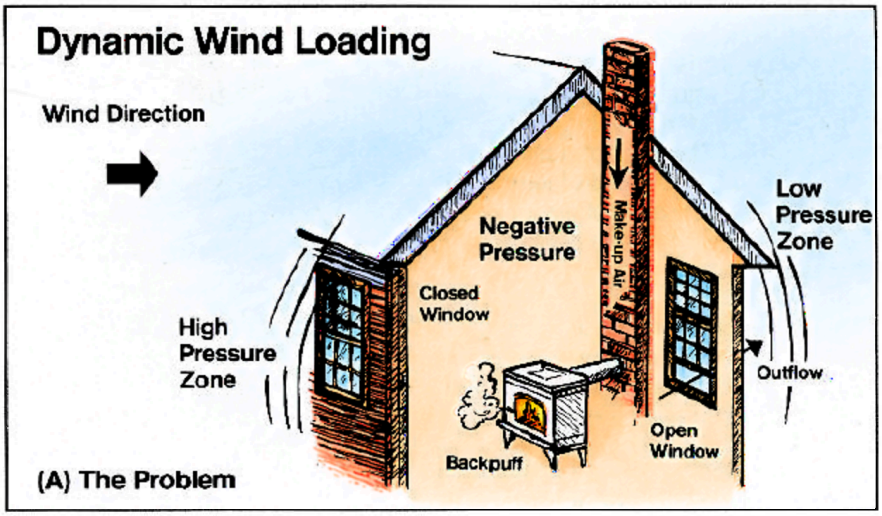


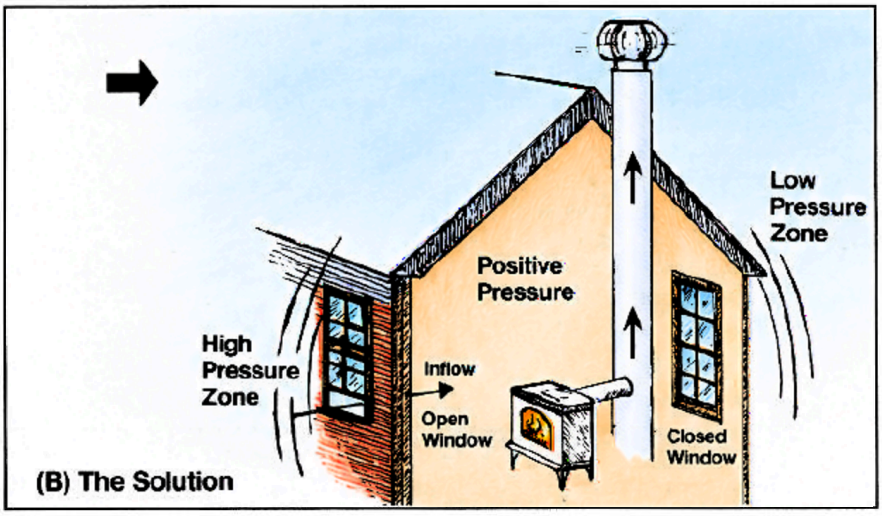
Wind induced downdraft from nearby tall buildings

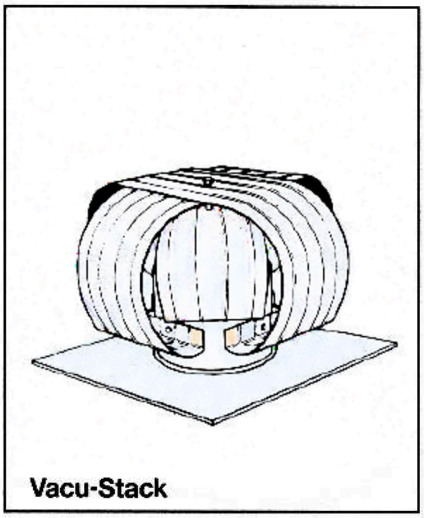
Negative air pressure and consequent tell-tale backpuffing may be particularly noticeable when a door or window is opened on a side of the building other than the windward side. To restore normal pressure in the building, make up air is apt to enter via the chimney and down into the living area. If the appliance is operating, smoke is then carried into the room.

This can be remedied by cracking open a window on the windward side of the house and closing windows on the other sides. The windward side is the side the wind strikes. A Vacu-Stack is recommended as a partial solution to this problem as well.

The occurrence of smoke and back-puffing when the air is calm may be caused by a number of structural factors that relate to the heating system.







Vacu-Stack

Chimney Problems (cont.)

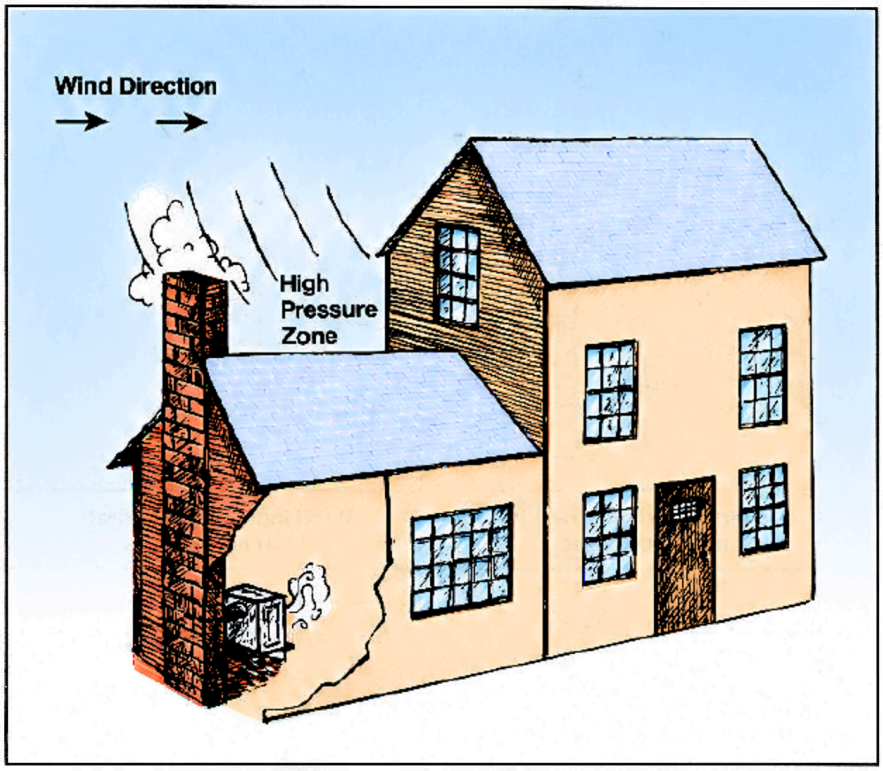
Another common cause of smoke and backpuffing is **Wind Loading** on a multi-story building. As the wind flows against the second story vertical wall, a high pressure zone develops at the chimney top. Although a Vacu-Stack is not guaranteed as a solution to this problem, field reports show satisfactory results in more than 50 percent of the installations.

The occurrence of smoke and backpuffing when the air is calm may be caused by a number of structural factors that relate to the heating system. The chimney may be too short or the flue opening may be too large or small for the heating appliances. Smoke may also occur if the chimney is blocked with soot, creosote or debris.

In a relatively air-tight house, negative pressure problems can be caused by appliances that exhaust the inside air, such as cooking range exhaust fans, a clothes dryer vent, furnaces or other devices.

Your individual chimney problem may be the result of a variety of factors. That's why we ask you to fill out our questionnaire. Our engineers will identify your exact problem and outline the corrective action for you to take.

Wind Loading on a Multi-story Building



Chimney Sweep Master
CHICAGO
312-957-6896

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